

REMARKS/ARGUMENTS

The Office Action mailed September 25, 2003 and the Advisory Action mailed March 29, 2004 have been reviewed and carefully considered. The Examiner stated in the Advisory Action that the amendment filed December 22, 2003 would be entered for purposes of an Appeal. The amendments described below are based on the claims in the amendment dated December 22, 2004. Claims 1, 14, 19, 20, 24, 25, and 29 are amended. Claims 1-29 are pending in this application, with claims 1, 14, 19, 20, 24, 25, and 29 being the only independent claims. Reconsideration of the above-identified application, as herein amended and in view of the following remarks, is respectfully requested.

In the Advisory Action mailed March 29, 2004, the Examiner stated that the independent claims 1, 14, 19, 20, 24, 25, and 29 stand rejected under 35 U.S.C. §103 as unpatentable U.S. Patent No. 6,009,311 (Killion) in view of U.S. Patent No. 6,211,671 (Shattil).

The Examiner does not mention the dependent claims in the Advisory Action. It is assumed that the rejections of these claims listed in the Final Office Action dated September 25, 2003 still apply. Dependent claims 2-5, 8-9, 11-12, 14-17, 21-23, and 26-28, therefore, are believed to stand rejected under 35 U.S.C. §103 as unpatentable over Killion and Shattil.

Claim 18 stands rejected under 35 U.S.C. §103 as unpatentable over Killion and Shattil and further in view of U.S. Patent No. 6,356,773 (Rinot).

Claims 6, 7, 10 and 13 stand rejected under 35 U.S.C. §103 as unpatentable over Killion and Shattil and further in view of U.S. Patent No. 5,995,854 (Wilson).

Before discussing the cited prior art and the Examiner's rejections of the claims in view of that art, a brief summary of the present invention is appropriate. The present invention relates to a device which (1) includes an antenna for generating an electromagnetic field and (2)

includes an active shield device to protect a user from the electromagnetic fields generated by the antenna. As shown in Fig. 1 of the present application, active shields 14a-14c are arranged in the apparatus between an antenna 12 and an operator's earpiece 10a. Page 4, lines 14-16, of the specification discloses that the antenna 12 is connected to an RF section of the device for receiving an antenna signal, the antenna generating an electromagnetic field in response to the antenna signal. The active shields 14a-14c are radiating devices which substantially cancel or reduce the electromagnetic field created by and emanating from the antenna 12 (see page 3, line 21 to page 4, line 1). To accomplish the desired effect, the active shields 14a-14c create a near field which is opposite to the field produced by the antenna 12 (page 4, lines 5-7). A coupler 20 is connected to the antenna signal and outputs the signal to both the antenna 12 and the active shields 14a-14c (see Fig. 2). Adjustment circuits 22a-22c are connected between the coupler 20 and the active shields 14a-14c (page 4, lines 17-19). The adjustment circuits 22a-22c adjust the antenna signal such that the active fields 14a-14c radiate the near fields to substantially cancel or reduce the electromagnetic radiation from the antenna 12 which is directed toward the user (page 4, line 22 to page 5, line 2).

Each of the independent claims 1, 14, 19, 20, 24, 25, and 29 has now been amended to specifically recite that a unit of the apparatus includes both (1) an antenna creating an electromagnetic field and (2) an active shield including a radiation device which generates a near field that substantially cancels the electromagnetic field in a predetermined region. Furthermore, the independent claims have been amended to recite that the electromagnetic field emanating from the antenna is in response to an antenna signal transmitted to the antenna from RF circuitry in the unit of the apparatus. Support for these amendments is found in Fig. 1 and the accompanying text, which shows that the antenna 12 and radiation devices 14a - 14c are in the same unit, and in Fig. 2 and the accompanying text which shows the antenna connected to the RF circuitry.

Killion discloses a method and apparatus for reducing audio interference created by cellular telephone transmissions in hearing aids. As explained at col. 1, lines 38-42 in the Killion reference, the internal wiring in a hearing aid acts as an antenna. Existing digital cellular phones use a switched carrier that cycles on and off at a frequency of 50Hz (USDC) or 217Hz (GSM). Figs. 2 and 3 of Killion show that the carrier for a digital cellular phone is switched on during time slots 20 and is off for the remaining time periods. The interference problem between hearing aids and cell phones is caused by the interruptions of the carrier (see col. 3, lines 51-58). According to a first solution of Killion, "garbage" carriers 31 are transmitted by the cell phone in the spaces between the time slots 20 (col. 3, line 59 to col. 4, line 14), such that the signal to the hearing aid is substantially constant. Accordingly, the carrier fields 31 in Killion do not cancel the electromagnetic field from the main antenna, as recited in independent claims 1, 14, 19, 20, 24, 25, and 29 of the present application.

In a further solution, Killion proposes that the cell phone have a local antenna 2 in addition to a main antenna 1. When the phone is transmitting in its time slot, the local antenna 2 is not energized (col. 4, lines 27-29). Between time slots, the phone energizes the local antenna 2 so that the near field generated by the local antenna 2 is equal to the near field generated by the main antenna 1 (col. 4, lines 29-34). Accordingly, it is not the purpose or effect of the local antenna 2 in Killion to cancel the electromagnetic field produced by the main antenna in response to the antenna signal, as expressly recited in independent claims 1, 14, 19, 20, 24, 25, and 29 of the present application. Rather, the local antenna disclosed by Killion maintains or keeps constant the effects of the electromagnetic field produced by the main antenna in a predetermined area, in the time slots in which the main antenna is not active; this prevents or reduces the audio interference otherwise caused by periodic switching of the carriers.

The additional embodiments described at col. 4, line 55 to col. 5, line 7 of Killion are mere variations of the above-described embodiment in which the local antenna 2 is turned on when the main antenna is turned off.

The embodiments of Killion disclosed at col. 5, line 8 to col. 6, line 45 and shown in Figs. 5, 7, and 8 of Killion include a noise cancellation circuit within the hearing aid which operates to cancel the signal generated by the cell phone antenna and received by the hearing aid antenna. In these embodiments, the noise cancellation circuit is in a separate unit from that which generates the electromagnetic field to be canceled. More specifically, the phone generates the electromagnetic field and the noise cancellation circuit cancels the radiation received by an antenna in the hearing aid. In contrast, the claims of the present application recite an apparatus comprising a unit having (i) a circuit for generating an antenna signal, (ii) an antenna which generates an electromagnetic field in response to the antenna signal, and (iii) a shield device for generating a near field substantially canceling the electromagnetic field in a predetermined region. Since the noise cancellation circuit of Killion is in the hearing aid, it can not be considered to be in the same unit which generates the electromagnetic field, as is recited in applicants' independent claims 1, 14, 19, 20, 24, 25, and 29.

In the Advisory Action of March 29, 2004, the Examiner refers to col. 5, lines 10-16 and col. 40-42 of Killion as disclosing an RF circuitry portion, an antenna creating an electromagnetic field, and the recited shielding device generating a near field. These portions of Killion refer to the embodiment of Killion in which the hearing aid includes a noise cancellation circuit. The hearing aid receives electromagnetic radiation from the phone. The antenna of the hearing aid picks up the electromagnetic radiation and generates a nullifying signal. This embodiment of Killion, however, fails to teach or suggest that the device or unit which generates the

electromagnetic field includes the cancellation circuit for nullifying the radiation in the area of the hearing aid, as is now recited in amended independent claims 1, 14, 19, 20, 24, 25, and 29.

Shattil fails to teach or suggest what Killion lacks. Shattil relates to a device having two or more coils for picking up external magnetic flux that induces signals in each of the coils and a cancellation circuit for canceling inductive noise components of the external magnetic flux. In Shattil, an interference-cancellation system for electromagnetic receivers adds a reference signal to a received signal to cancel inductive noise from the received signal (col. 4, lines 51-65).

Inasmuch as Shattil merely teaches adjustment of the signal produced by the received radiation at a receiver, it fails to teach or suggest creating a near field to substantially cancel a magnetic field generated by an antenna in a predetermined region, as recited in applicants' claims. Accordingly, it is respectfully submitted that independent claims 1, 14, 19, 20, 24, 25, and 29 are allowable over Killion in view of Shattil.

Rinot is directed to a passive shield which absorbs electromagnetic radiation (col. 5, lines 24-25). Accordingly, Rinot likewise fails to teach or suggest the claimed active shield radiators for creating a near field for canceling the electromagnetic field created by the antenna in a predetermined area.

Wilson relates to a shielding accessory for a communication device. The shielding accessory comprises a microscreen with apertures sized to block RF radiation without blocking sound or light waves (col. 3, lines 51-54). Accordingly, Wilson also fails to teach or suggest an active shield comprising radiators for creating a near field that cancels the electromagnetic field produced by the antenna in a predetermined area.

It is therefore respectfully submitted that each of independent claims 1, 14, 19, 20, 24, 25, and 29 is allowable over Killion in view of Shattil, Rinot, and/or Wilson.

Dependent claims 2-13, 15-18, 21-23 and 26-29, being variously dependent on one of independent claims 1, 14, 19, 20, 24, 25 and 29, are deemed allowable for at least the same reasons expressed above with respect to independent claims 1, 14, 19, 20, 24, 25 and 29.

This application is now deemed to be in condition for allowance, and early notice to that effect is solicited.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any such fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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